

desirable strength, adhesive, and flexible properties. The resin of the invention also withstands high build-up of static electric charges which occur on electronic vessels and envelopes without deleterious effects. Such resistance to loss of properties when exposed to high energy radiation and electric charges is of inestimable value for use in making of cathode ray tubes provided with laminated safety panels.

(6) The resin of the invention possesses such adhesion, flexibility, and strength that it serves as an excellent laminant for adhering glass shields or panels on the face of envelopes or bulbs wherein the face forms curves of short radius of curvature (usually referred to as "sharp" corners) with the side walls of the envelope. The quality of maintaining all desirable properties, although being employed as a laminant between glass surfaces having bends and folds of short radius of curvature, is especially exemplified in a television tube of the type shown in FIGURE 2. Heretofore such tube design was not possible because of the strains induced about the periphery of the laminant where the radius of curvature approaches that of a right angle. For best viewing and safety, it is desirable that the periphery of the safety panel extend over and, to some distance, behind the "sharp" corners, and usually extends along the outside of the side walls of the envelope to a distance just rearward or behind the edge of the phosphor screen which is positioned just inside and parallel to the viewing face.

(7) The resin of the invention provides such reliable and strong adhesive bonds when employed as a laminant between a television tube viewing face and a protective face plate that it may be and is employed as the supporting means for the entire picture tube in a television receiving set. It has been found that by providing suitable hangers along the periphery of the laminated protective plate or panel, the tube may be advantageously suspended thereby in the receiving set.

(8) In the uncured state, the resin is sufficiently fluid, adhesive, and free from any tendencies to form bubbles and the like, to serve as a highly appropriate laminant for use in an imposing number of laminating processes without the need for added pressure during laminating and cure. Heretofore safety glass, such as that made by employing polyvinylbutyral and other known laminants, have required relatively high pressures involving the use of pressuring means, presses, and other equipment, resulting in objectionable expenditures of time, labor and outlay.

Having described the invention, what is claimed and desired to be protected by Letters Patent is:

1. A cathode ray tube provided with a substantially shatter-proof safety panel comprising a cathode ray tube having a transparent viewing face, a transparent similarly contoured transparent panel substantially uniformly spaced therefrom in mating relationship and firmly bonded thereto by a flexible, tenaciously adhering, transparent, thermally stable cured solid resin consisting essentially of the reaction product of (A) a polyepoxide ether of an aromatic polyhydric compound, (B) a polyepoxide ether of an aliphatic polyhydric compound having an average of between about 1.5 and 2 oxirane groups per molecule, and (C) a modifier selected from aliphatic polyepoxide compounds having an average of more than 2 oxirane groups per molecule, said (A) and (B) being employed in the weight proportions of between 80 and 20 of each and said (C) being employed up to 40 parts by weight and (D) a curing agent, selected from the class consisting of a major proportion of a monoalkanolamine and a minor proportion of a polyalkylenepolyamine in an amount sufficient to provide between 0.5 and 1.5 equivalent hydrogen atoms per oxirane group in said resin composition.

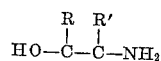
2. A composition especially adaptable to produce transparent flexible elastomeric castings consisting essentially of (A) a first transparent polyglycidyl ether, (B) a second transparent polyglycidyl ether, and, a compatible hardening agent; said first polyglycidyl ether being a diglycidyl

ether of 4,4'-isopropylidenediphenol said ether having a molecular weight of from about 900 to 1200; said second diglycidyl ether being a diglycidyl ether of polyoxypropylene glycol, said glycol having a molecular weight of about 400; said hardening agent being a mixture of about 5.5 parts by weight of monoethanolamine and about 1 part by weight of diethylenetriamine; the ingredients (A) and (B) being employed in an amount of about 33 parts of (A) and 67 parts of (B) said hardening agent being employed in an amount of about 6.5 parts by weight.

3. A laminar structure comprising a first transparent surface spaced apart from a generally similar transparent surface, said surfaces being held in opposite relationship by a transparent solid elastomeric adhesive resin composition consisting essentially of the reaction product of: (A) a first transparent polyglycidyl ether, (B) a second polyglycidyl ether, and a compatible hardening agent; said first polyglycidyl ether being a diglycidyl ether of 4,4'-isopropylidenediphenol, the ether having a molecular weight of from about 900 to 1200; said second diglycidyl ether being a diglycidyl ether of polyoxypropylene glycol, said glycol having a molecular weight of about 400; said hardening agent being a mixture of about 5.5 parts by weight of monoethanolamine and about 1 part by weight of diethylenetriamine; the ingredients (A) and (B) being employed in an amount by weight of about 33 parts of (A) and about 67 parts of (B) and said hardening agent being employed in an amount of about 6.5 parts.

4. A safety cathode ray tube comprising a cathode ray tube having a viewing surface, a transparent, generally similar, contoured plate spaced apart from said viewing surface and having said viewing surface adhered to said plate by a transparent solid flexible elastomeric composition consisting essentially of the cured reaction product of: (A) a first transparent polyglycidyl ether; (B) a second transparent polyglycidyl ether, and a compatible hardening agent; said first glycidyl ether being a diglycidyl ether of 4,4'-isopropylidenediphenol, said ether having a molecular weight of from about 900 to 1200; said second diglycidyl ether being a diglycidyl ether of polyoxypropylene glycol, said glycol having a molecular weight of about 400; said hardening agent being a mixture of about 5.5 parts by weight of monoethanolamine and about 1 part by weight of diethylenetriamine; the ingredients (A) and (B) being employed in an amount by weight of about 33 parts of (A) and about 67 parts of (B) and said hardening agent being employed in an amount of about 6.5 parts.

5. The liquid homogeneous resinous composition curable on standing to an elastomeric thermoset resin which, when set, is capable of transmitting at least 80 percent of light within the visible spectrum incident thereto without adverse effect on the color or image produced by the light transmitted therethrough when said resin is in a layer that has a thickness not substantially greater than 0.1 inch, which is capable of forming cohesive bonds of high strength with glass in contact therewith during cure, which possesses high thermal stability, which has an elastic recovery of at least about 80 percent, and which better withstands sudden shock and pressure changes without damage, said resinous composition consisting essentially of a mixture of between about 25 and about 40 parts by weight of component (A) which is an aromatic polyepoxide ether of a polynuclear polyhydric phenol and between about 75 and about 60 parts by weight of component (B) which is an aliphatic polyepoxide ether of a dihydric aliphatic compound, to make 100 parts of (A) and (B), and a hardening agent consisting by weight of (1) between about 78 and about 92 percent of a monoalkanolamine having the generic formula



wherein R and R' are independently selected from lower alkyl groups, and (2) between about 22 and about 8